

# Assessment of Missing Opportunity of Vaccination at Primary Health Care Center: A Retrospective Study

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## Abstract

**Objectives:** The study aim is to assess the vaccination status of children under two years old in Al-Asatetha primary health care center, Hilla, Babylon province, Iraq.

**Method:** Retrospective study design (Retrospective chart review) was used to assess the missed opportunities of vaccination for children under the age of two years by reviewing their immunization status from medical reports at the primary health care center. The purposive sampling was used to collect the data of 1000 children born from 1-1-2020 to 31-12-2020 through the period from 1 December 2021 to 1 February 2022.

**Results:** The finding of the current study showed that the age of children in the selected period (2020-2021) was between 11–23 months, the number of children (1–8) in the same family, and almost all of these families reside in urban areas. Regarding the parents' educational level the high percentage of both fathers and mothers were attained a primary level of education, and most of the fathers were working, while most of the mothers were not work. Concerning the vaccination status the finding showed that the percentage of missed vaccination opportunities reached 61%, and there was a significant positive correlation between vaccination status and (family residence, parental education level, and fathers' occupation) with a *P* value of 0.01. On the other hand, the number and the order of children in families had an inversely significant relationship with vaccination status at a *P* value of 0.01.

**Conclusion:** The study concludes that numerous factors affect the vaccination rate such as parents' education attainment and awareness, family size, address, and economic status of the family.

**Key words:** Vaccination, vaccines, missed opportunity for vaccination (MOV)

## Introduction

Immunization define as one of the most efficient, safest, and cost-effective public health care interventions to prevent death and disability that can be controlled by vaccination. "Immunization will help to achieve the Millennium Development Goals (MDGs) on reducing child mortality, improving maternal health, and preventing diseases" resulting in improved global, national, and regional levels of social, economic, and health outcomes.<sup>1,2</sup>

Immunization leads to a remarkable reduction in cases of vaccine-preventable infectious diseases among children.<sup>2,3</sup> Moreover, the whole benefits of immunization can be accomplished, if the missed opportunities for vaccination (MOVs) are eliminated and global vaccination coverage improves.<sup>4</sup>

The missed opportunity for vaccination define as any time the children or pregnant women of childbearing age who are eligible for vaccination (i.e., unvaccinated, partially vaccinated, or not up-to-date on vaccinations) and makes contact with health services but do not receive all of the vaccine doses for which they are eligible.<sup>5,6</sup>

The "World Health Organization (WHO) established the Expanded Program on Immunization (EPI) in 1974" to improve global vaccination coverage and achieve universal access to immunization. In 1977, the program set many goals to make immunization against diphtheria, pertussis, tetanus, poliomyelitis, measles, and tuberculosis available to every child in the world by 1990.<sup>7</sup>

In 1985, the "Expanded Program of Immunization (EPI) was well established in Iraq to deliver immunization services to targeted groups and implement national and global

strategies to achieve the main objectives of the program by improving the global coverage of vaccination".<sup>8</sup>

However, despite the fact that vaccine compliance is a major aspect of preventative healthcare, there is a large gap between immunization mandates and actual compliance.<sup>9</sup>

Various researchers have addressed the factors that cause vaccination delays. Although the children eventually get the immunization, this concept considers essential since many delayed cases lead to inadequate vaccination of the children. Most of these factors include: single-parent households, child's health status, larger family size, family socioeconomic status, low parental education level, geographic location, medicaid enrollment, absence of primary health care provider, and lack of insurance coverage.<sup>10-13</sup>

## Study Objectives

The current study aimed to assess the vaccination status of under two year's children in Al-Asatetha primary health care center (PHC)/Hilla-Iraq, in addition, to finding out the correlation between the missed opportunity of vaccination and some sociodemographic variables.

## Methods

### Study Design

Retrospective study design (Retrospective chart review) was used to assess missed opportunities of under two years'

children, through reviewing their immunization status from medical records of PHC.

### Sample & Setting of the Study

Purposive sampling of 1000 children was born from 1-1-2020 to 31-12-2020; collected from the medical reports at Al-Asa-tetha primary health care center through the period of 1st December 2021 to 1st of February 2022.

### Instruments

The questionnaire was constructed after extensive literature reviews and used for the study, which consisted of two parts:

Part 1: Items related to demographic data of parents and children: This part is concerned with the personal information of parents (occupation and education) and children (age, gender, and order).

Part 2: Items related to the vaccination status of children in this part the data was divided into three categories of vaccination status:

The first group was completely vaccinated children, the second group was partially vaccinated children (children who missed one to five vaccines up to their ages), and the third group was children who completely missed their vaccines or were unvaccinated (children missed more than five vaccines up to their ages). All of these data are according to the Iraqi schedule of vaccination.

### Statistical Analysis

The data was analyzed statistically by using “Statistical Package for Social Sciences (SPSS) version 26 through the application of descriptive statistical data analysis including frequencies, percentages, mean of the score (MS) with their standard deviation (SD), inferential statistics, and spearman correlation.

### Results

Table 1 shows that 40% of children between the age of 16-20 months and the percent of males were equal to females children in the study, regarding children number the minimum number was one child, while the maximum number was eight children in the family. 50% of these families have 2-3 children, and 80% of them reside in urban areas. Concerning the parents’ educational attainment, more than 35% of both fathers and mothers have a primary level of education, and regarding the parents’ occupation, the finding shows that 75% of fathers were working while 88% of mothers were not working.

Table 2 shows that there was a significant positive correlation between vaccination status and (family address, parent education, and father occupation) at  $P$ -value  $< 0.01$ . In another hand, the children’s number and child order in families had an inverse signification correlation with the vaccination status at  $P$ -value  $< 0.01$ .

### Discussion

The current study shown in (Table 1) that the target ages of children in the selected period (2020-2021) were between 1-2 years, and less than half of them were between 16-20 months regarding children number in the family; half of these families

have 2-3 children, while some of them have more than six children, and almost all of them reside in the urban area. Concerning the parents’ educational attainment, the finding reveals that one-third of parents completed a primary level of education and about the parents’ occupation: most fathers are working while most mothers are not working. These findings were similar to a study conducted by Asiegbu and his colleagues in (2020)<sup>14</sup> and both of the studies that conducted in Baghdad by Abbas and his colleague in (2016)<sup>15</sup> and Fadil and his colleague in (2010).<sup>2</sup>

MOV is a hurdle to rising immunization coverage among children and women of childbearing age worldwide,<sup>16</sup> and the

Table 1. Sociodemographic characteristics of children and their parents (No. 1000)

Items	Interval	Freq.	Percent
Child age per months	11–15	375	37.5
	16–20	407	40.7
	21+	218	21.8
	<b>Minimum (11 months)</b>	<b>Maximum (23 months)</b>	<b>Mean 16.97 Std. Deviation 3.558</b>
Child gender	Male	518	51.8
	Female	482	48.2
Children number	<b>Minimum: 1 child</b>	<b>Maximum: 8 children</b>	
Child order	1st	256	25.6
	2nd	<b>292</b>	<b>29.2</b>
	3rd	215	21.5
	4th	120	12.0
	5th	72	7.2
	6th	33	3.3
	7th	10	1.0
	8th	2	.2
Residency	Rural	199	19.9
	Urban	<b>801</b>	<b>80.1</b>
	Illiterate	10	1.0
Father level of edu.	Primary	<b>372</b>	<b>37.2</b>
	Intermediate	225	22.5
	Secondary	113	11.3
	Diploma and above	<b>280</b>	<b>28.0</b>
Mother level of edu.	Illiterate	71	7.1
	Primary	<b>355</b>	<b>35.5</b>
	Intermediate	185	18.5
	Secondary	87	8.7
Father occupation	Diploma and above	<b>302</b>	<b>30.2</b>
	Not work	246	24.6
	Work	<b>754</b>	<b>75.4</b>
Mother occupation	Not work	<b>882</b>	<b>88.2</b>
	Work	118	11.8

Table 2. Correlations coefficient between vaccination status and sociodemographic variables

Spearman's rho		Address	Child order	Children numbers	Father Edu.	Mother Edu.	Father occupation	Mother occupation
	Correlation Coefficient	.157**	-.157**	-.165**	.116**	.123**	.114**	.013
Vaccination Status	Sig.	.000	.000	.000	.000	.000	.000	.691
	N	1000	1000	1000	1000	1000	1000	1000

Correlation is significant at the 0.01 level (2-tailed).\*\*

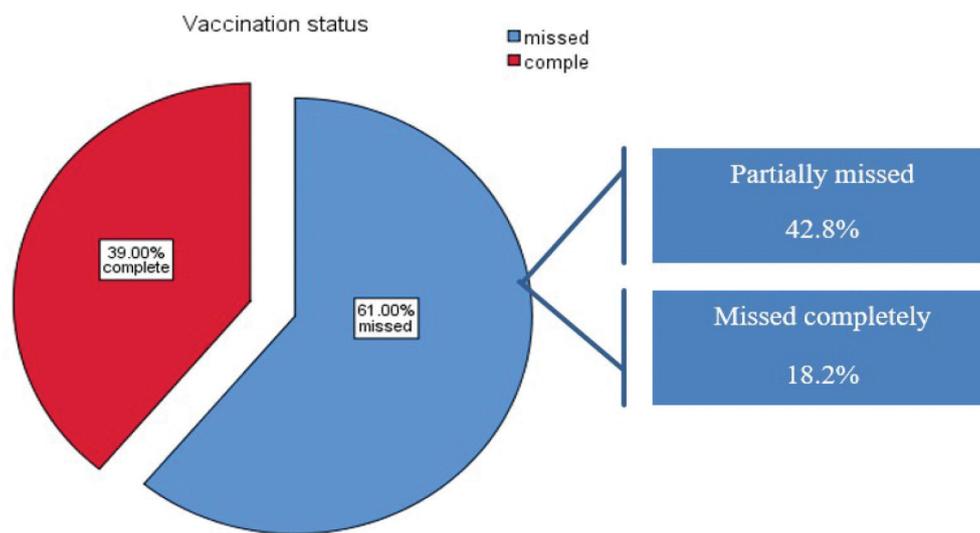


Fig. 1 Missing opportunity of vaccine status of 1000 children in PHC.

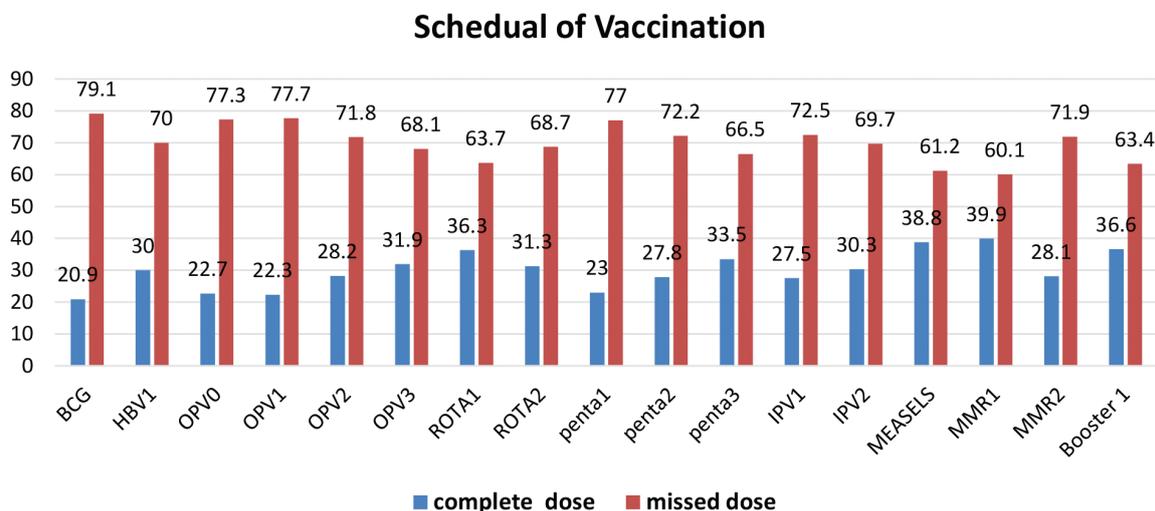


Fig. 2 Schedule vaccination status of 1000 children in PHC.

results show in (Figure 1) that the missing opportunities of the vaccination status of 1000 children in al Asatetha PHC revealed that there are three categories of vaccination status; one-third of children are fully vaccinated, less than half of them have partially vaccinated children and less than quarter of children completely missing their vaccination, and this finding goes in line with the result of Mahmood, (2012), which performed on infant children in Diyala Province/Iraq that

found (70%) of children were fully vaccinated, (24%) were partially vaccinated children and (6%) were non-vaccinated children. Another study showed that (75.4%) were fully vaccinated, and most of them were vaccinated during immunization campaigns.<sup>17</sup> Whereas, Asiegbu and his colleagues in (2020) found that (71.6%) had missed vaccination appointments for their children with the far immunization center<sup>14</sup> and Kaboré and his colleagues also found that 76% eligible

children for vaccination missed their opportunity to be vaccinated when visiting the health facilities [Figure 2](#).<sup>18</sup>

Regarding the factors that affect MOV, ([Table 2](#)) shows that there is a positive relationship between vaccination status with some sociodemographic variables such as (family address, parents' education attainment, and fathers' occupation), which means when the level of parents' education this leading to increase awareness about the benefits of childhood vaccination. In another hand, the increased children number and child order in the family have a negative relationship with the vaccination status, and this means the family size affects vaccination status. The previously mentioned findings are similar to the results of research conducted in Erbil/Iraq by Hassan & Ahmed, (2020), which concluded that children who are not vaccinated on time are likely to be from family of low socio-economic status and having low parental educational level.<sup>19</sup> and another research conducted by Asiegbu et al., (2020) revealed the Mothers' Educational status, and place of residence were significantly associated with increase knowledge of childhood vaccination.<sup>14</sup>

In addition to Dombkowski and his colleagues, which found that parental education, the Absence of a two-parent household, and large family size all of these reasons contribute to the delay of child vaccination.<sup>12</sup> While some scholars found that the increase in parents' education and awareness regarding immunization and vaccination and even reminding them by using digital media can significantly affect immunization coverage and reduce the missing opportunity for vaccination.<sup>17,18</sup> Furthermore, The study by Abdul Rahman and his colleagues conducted in Kurdistan/Iraq found the role of religious leaders in improving vaccination coverage about 95% post-intervention period compared with 55% of vaccination coverage pre-intervention period.<sup>20</sup>

## Conclusion

The overall vaccination rate showed that missed vaccination opportunities reached 61%, and this is due to many reasons

such as parents' education attainment, number of children in the family, and family residential area. Therefore, when the parents have a high level of education, then the vaccination rate increase, and if the family have a few children, the missed opportunity of vaccination decrease.

## Recommendations

1. Using digital media such as social media and television by health institutions and concerned authorities to increase awareness of families regarding the importance of taking vaccines and their benefits.
2. Recommend the health institutions to use SMS text messages to remind the families about times of vaccinations, and this technique will help in reaching the children's immunization coverage.
3. Increase vaccination campaigns by PHCS to achieve the EPI goals of WHO.

## Ethical Considerations

The research was conducted with ethical approval from the University of Babylon's nursing college.

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## Authors' Contributions

Each of the authors made significant contributions in this study.

## Conflict of Interest

There are no conflicts of interest revealed by the authors. ■

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